

Claims

1-Device for flexible inter-vertebral linking (1) characterized in that it is comprised of two sets of means

a first set of means (11) comprised of rigid means (110, 112, 114, 115, 116) made from preferably metallic and bio-compatible materials ensuring the mechanic performance of de device by integrally transmitting the stresses without being distorted

a second set of means (12) made up of flexible or damping means (121 and 122) manufactured out of visco-elastic bio-compatible materials, tolerating repetitive elastic distortions, the combination of these two sets of means enabling the resistance to mechanic stresses to which it will be subject to, and also enabling to damp them, in order to bring a remedy to all deficiency of the human-body anatomical links.

2-Device for flexible inter-vertebral linking (1) according to claim 1 characterized by the fact that the means (110) is a mechanic structure consisting of a rod (111) one of the ends of whom is surmounted by a circular plate (113b) related to a rod (111) with a joining radius , the set being slidable in the hollow of the means (114) enclosing the visco-elastic element (121)

3-Device for flexible inter-vertebral linking (1) according to claim 1 characterized in that the mechanical structure (112, 115) is a cap equipped with a thread (117) enabling to fasten the said structure (112, 115) on the structure (114), the means (112, 115) having a shoulder area which encloses the visco-elastic means (121) between itself and a plate (113b).

4-Device for flexible inter-vertebral linking (1) according to claim 1 characterized in that the means (114) consists of two hollow cylinders out of which one is tapped in order to enable the fastening of a rod (116) with a threaded tip.

5-Device for flexible intervertebral linking (1) according to claim 1 characterized in that the visco-elastic means are:

for (121) a centering ring permitting that the rod (111) should glide in the former's center

for (122) a full disk, these means being conceived in order to undergo a large number of stresses by elastic distortion following compression stresses which are not uniformly distributed.

6-Device for flexible intervertebral linking (1) according to one of claims 1 to 5 characterized in the fact that the visco-elastic means (121 and 122) are integrated or enclosed within mechanic structures (110, 112, 114, 115, 116) thus protected against the environment of the human body, which avoids the formation of fibers that could disturb the operations of the device (1).

7-Device for flexible inter-vertebral linking (1) according to one of claims 1, 3 or 6 characterized in that the means (112) is a mechanic structure having an orifice (119) large enough for enabling a clearance of the rod (11) and for there being a functional allowance between the plate (113) and the hollow of the means (114), the said means thus providing that the device operate in tension/compression and flexion.

8-Device for flexible intervertebral linking (1) according to one of claims 1 to 6 characterized in that the means (115) is equipped with thread (117) and comprises a cap (115c) whose orifice (119) is adjusted to the diameter of the rod (110), being extended by a guiding rod (115a), which enable to the device (1) to operate only in the compression mode.

9-Device for flexible intervertebral linking (1) according to one of the foregoing claims characterized in that the means (114) has a bore (114a) enabling guidance without excessive friction of the rod (110) in the said means (114).

10-Device for flexible intervertebral linking (1) according to one of the foregoing claims characterized in that the diameter of the visco-elastic centering rings (121 and 122) is adjusted freely in order to enable them to compress up to a stress threshold corresponding to the contact with the bore (114a) of the means (114).

11-Device for flexible intervertebral linking (1) according to one of the foregoing claims characterized in that the visco-elastic means (141 and 142) are a cylinder and a ring respectively, having an inclined face, enabling thus, thanks to the combination of the set of means (12) with the eccentric orifice (119), that there should be obtained clearances and a damping of the rod following an axis which forms an angle with the rod (131).

12-Device for flexible intervertebral linking (1) according to one of the foregoing claims characterized in that the orifice (119) of the set of rigid means (11) enables to limit or to prevent the clearance of the rod (110), determining thus that the device 1 should operate, in the desired directions.